REMARKS

103(a) Rejections

The Office Action rejects claims 1-33 under 35 U.S.C. 103(a) as being anticipated by Murphy in view of Bingler. Applicants have amended claim 1 to better distinguish over the Murphy and Bingler references. Claim 1, as amended, is directed toward an integrated fan pump comprising a housing for supporting the integrated fan pump. The housing has a rectilinear configuration. The invention includes a fan that is coupled to the housing and has a fan head, and a fan propeller that is coupled to the fan head. The fan propeller is selected from the group consisting of axial, tubeaxial, centrifugal, crossflow, backward-curved, forward-curved, airfoil, turbine, and straight radial. The invention includes a pump adapted to transfer a coolant from a coolant inlet to a coolant outlet. An external geometry of the pump is adapted to be sufficiently compact such that gas flow through the fan and around the pump is substantially unimpeded by the pump. The gas flow moves from a gas flow inlet in a substantially straight, unchanged direction to a gas flow outlet. The pump has a pump head. The invention includes a pump impeller coupled to the pump head. The pump impeller is selected from the group consisting of axial propeller blade, straight radial blade, centrifugal blade, backward-curved blade, forward-curved blade, and turbine blade. The invention includes a phase change device coupled to the pump, an axle that has a first axle segment coupled to the fan head and a second axle segment coupled to the pump head, and a mechanical gear coupled to the first axle segment and the second

axle segment. The mechanical gear is configured to rotate the first axle segment at a different rate than the second axle segment. The invention includes an expansion tank coupled to the pump, a gas-release valve coupled to the expansion tank, and a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene, chloroprene, fluoro, silicone and butyl rubbers. The invention includes a heat source connected to the coolant outlet of the pump, and a heat exchanger coupled to the expansion tank. The heat exchanger includes a plurality of disc-shaped fins and is coupled to the heat source. The heat exchanger uses heat conduction and forced convection to transfer heat from the heat source to the coolant and is directly mounted to a surface of the fan. The invention includes an electrical drive mechanism. The electrical drive mechanism is a DC brushless motor and includes a first magnet coupled to the pump. The first magnet has a disc shape. The drive mechanism includes a second magnet coupled to the fan. The second magnet has a disc shape. The first magnet and the second magnet are substantially collinear. The drive mechanism includes a magnetic coil disposed between the first magnet and the second magnet. The magnetic coil has two solenoids. The electrical drive mechanism is configured to simultaneously drive the fan and the pump. The electrical drive mechanism has a rotational rate in the range of 2000 to 3000 rpm and the pump has a pump flow rate in the range of 5 cc/sec to 10 cc/sec and rotates the fan and the pump with respect to the housing.

Neither the Murphy nor Bingler references, taken singularly or in combination, teach or suggest an integrated fan pump configuration as claimed having an axle that includes a first axle segment coupled to the fan head and a second axle segment coupled to the pump head. The first and second axle segments are coupled via a mechanical gear, and the first axle segment rotates at a different rate than the second axle segment. As described in paragraph [0042], a single axle may include two segments that are connected by a gearing mechanism such as one or more gears, linkages, or other mechanical couplings. Configured in this manner, the axle allows for the speed and power of the pump to be tailored to the strength of the motor.

The references similarly fail to disclose a phase change device coupled to the pump. The phase change device facilitates the transfer of heat energy from a heat source.

The Murphy and Bingler references also fail to disclose an integrated fan pump having an integrated expansion tank and a gas-release valve coupled to the expansion tank. With reference to paragraph [0034] of the present application, the expansion tank may generally function as a coolant fill port and reservoir. The gas-release valve provides a mechanism by which the gas pressure within the expansion tank may be equalized with a gas-pressure outside of the expansion tank.

Neither reference, taken singularly or in combination, discloses a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene, chloroprene, fluoro, silicone and butyl

rubbers and prevents the transfer of liquid between the pump and the fan.

The Murphy and Bingler references also fail to disclose the claimed electrical drive mechanism. The electrical drive mechanism includes a first magnet that is coupled to the pump. The first magnet has a disc shape. The electrical drive mechanism includes a second magnet that is coupled to the fan. The second magnet has a disc shape. The first magnet and the second magnet are substantially collinear. Finally, the electrical drive mechanism includes a magnetic coil disposed between the first magnet and the second magnet. The magnetic coil including two solenoids. The electrical drive mechanism rotates the pump and the fan with respect to the housing.

Claim 1, as amended, is believed to patentably distinguish over the Murphy and Bingler references. None of the references of record taken singularly or in combination teach an integrated fan pump configured in the manner as claimed.

Applicants have amended claim 11 to better distinguish over the Murphy and Bingler references. Claim 11, as amended, is directed to an integrated fan pump comprising a housing for supporting the integrated fan pump, a fan coupled to the housing and having a fan head, and a fan propeller coupled to the fan head. The fan propeller is selected from the group consisting of axial, tubeaxial, centrifugal, crossflow, backward-curved, forward-curved, airfoil, turbine, and straight radial. The invention includes a pump adapted to transfer a coolant from a coolant inlet to a coolant outlet. An external geometry of the pump is adapted to be sufficiently compact such that gas flow through the fan and around the pump is substantially unimpeded

by the pump, the gas flow moving from a gas flow inlet in a substantially straight, unchanged direction to a gas flow outlet. The pump includes a pump head. The invention further includes a pump impeller coupled to the pump head. The pump impeller is selected from the group consisting of axial propeller blade, straight radial blade, centrifugal blade, backward-curved blade, forward-curved blade and turbine blade. The invention includes a phase change device coupled to the pump, an expansion tank coupled to the pump, a gas-release valve coupled to the expansion tank, an axle that is fixed to the housing that includes a first axle segment and a second axle segment, a mechanical coupling connected to the first axle segment and the second axle segment, and a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene, chloroprene, fluoro, silicone and butyl rubbers. The invention further includes a heat source connected to the coolant outlet of the pump, and a heat exchanger coupled to the expansion tank. The heat exchanger includes a plurality of disc-shaped fins and is coupled to the heat source, the heat exchanger using heat conduction and forced convection to transfer heat from the heat source to the coolant, and the heat exchanger is directly mounted to a surface of the fan. The invention includes an electrical drive mechanism configured to simultaneously drive the fan and the pump. The electrical drive mechanism has a rotational rate in the range of 2000 to 3000 rpm and the pump has a pump flow rate in the range of 5 cc/sec to 10 cc/sec and includes an electric motor configured to rotate the fan and the

pump with respect to the housing and about the axle that is fixed to the housing.

Applicants believe that claim 11 distinguishes over the Murphy and Bingler references. Neither the Murphy nor Bingler references taken singularly or in combination teach or suggest an integrated fan pump having an integrated expansion tank and a gas-release valve coupled to the expansion tank. With reference to paragraph [0034] of the present application, the expansion tank may generally function as a coolant fill port and reservoir. The gas-release valve provides a mechanism by which the gas pressure within the expansion tank may be equalized with a gas-pressure outside of the expansion tank.

Neither reference taken singularly or in combination discloses a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene, chloroprene, fluoro, silicone and butyl rubbers and prevents the transfer of liquid between the pump and the fan.

The references taken singularly or in combination do not teach or suggest an integrated fan pump configuration as claimed having an axle that includes a first axle segment and a second axle segment. The first and second axle segments are coupled via a mechanical coupling.

The Murphy and Bingler references similarly fail to disclose a phase change device coupled to the pump. The phase change device facilitates the transfer of heat energy from a heat source.

The references similarly fail to disclose an integrated fan pump having an electric motor configured to rotate the fan and the pump with respect to a housing and about an axle fixed to the housing.

Accordingly, claim 11, as amended, is believed to patentably distinguish over the prior art references. Claims 12-14 and 18-20 are believed to be in condition for allowance as they depend from what is believed to be an allowable base claim.

Applicants have amended claim 24 to better distinguish over the Murphy and Bingler references. Claim 24, as amended, is directed to a method of manufacturing an integrated fan pump, comprising providing a housing for supporting the integrated fan pump, providing an axle coupled to the housing, and providing a fan coupled to the housing. The fan includes a fan head and a fan propeller. The method includes providing a pump adapted to transfer a coolant from a coolant inlet to a coolant outlet. The pump is positioned entirely outside a gas flow region of the fan such that gas flow through the fan and around the pump is substantially unimpeded by the pump, the gas flow moves from a gas flow inlet in a substantially straight, unchanged direction to a gas flow outlet. The pump includes a pump head and a pump impeller, and the fan head and the pump head are attached to the axle, the fan, pump and axle rotate together with respect to the housing. The method includes providing an expansion tank coupled to the pump, providing a gas-release valve coupled to the expansion tank, and providing a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene,

chloroprene, fluoro, silicone and butyl rubbers. The method includes providing a heat exchanger coupled to the expansion tank. The expansion tank is coupled to the coolant inlet of the pump, and the coolant outlet of the pump is coupled to the heat source to provide cooling thereof. The method includes providing a heat source coupled to the heat exchanger, and providing an electrical drive mechanism configured to simultaneously drive the fan and the pump.

Neither the Murphy nor Bingler reference, taken singularly or in combination, teach or suggest a method of manufacturing an integrated fan pump having an integrated expansion tank and a gas-release valve coupled to the expansion tank. With reference to paragraph [0034] of the present application, the expansion tank may generally function as a coolant fill port and reservoir. The gas-release valve provides a mechanism by which the gas pressure within the expansion tank may be equalized with a gas-pressure outside of the expansion tank.

The references taken singularly or in combination also fail to disclose a liquid seal formed between the fan head and the pump head proximate to the axle. The liquid seal includes a material selected from the group consisting of nitrile, polyacrylate, ethylene propylene, chloroprene, fluoro, silicone and butyl rubbers and prevents the transfer of liquid between the pump and the fan.

Accordingly, Applicants believe claim 24, as amended, patentably distinguishes over the prior art references. Claims 27 and 32 are therefore believed to be in condition for allowance as they depend from what is believed to be an allowable base claim.

Examiner's Reliance on Alleged Admissions

In the Office Action, the Examiner rejects claims 2-33 based upon alleged admissions by Applicants that the claims do not contain patentable subject matter. Specifically, the Examiner relies upon statements made by Applicants in response to a restriction requirement mailed on July 27, 2006 stating various species of the invention identified by the Examiner were not independent and distinct. The Examiner maintains that Applicants' statements render the present claims unpatentable over the prior art in view of the Examiner's rejection of independent claim 1.

In the response to the restriction requirement, Applicants stated that the various species identified by the Examiner were not independent and distinct and that, as a result, "claims 1-23, and Figs. 5, 6, and 7 to which the claims are directed, are not patentably distinct." The statements referred only to the status of the claims with respect to each other and in no way characterized the patentability of the claims over the prior art. In fact, the analysis of whether two species identified within a single application are independent and distinct is entirely separate from the analysis of whether any of the claims in the application are patentable over the prior art. See MPEP 802.01. Accordingly, the determination that one claim in a patent application is not independent and distinct of another claim is entirely irrelevant to the determination of whether either or both claims distinguish over the prior art.

Because the Examiner incorrectly uses Applicants' statements made in response to a restriction requirement to find claims in the present application unpatentable over the prior

art, and because the Examiner fails to provide an alternative basis for rejection of each of the claims, Applicants respectfully maintain that the Examiner has failed to show that the claims are unpatentable over the prior art taken singularly or in combination.

Conclusion

Applicants believe that all information and requirements for the application have been provided to the USPTO. If there are matters that can be discussed by telephone to further the prosecution of the Application, Applicants invite the Examiner to call the undersigned attorney at the Examiner's convenience.

The Commissioner is hereby authorized to charge any fees due with this Response to U.S. PTO Account No. 17-0055.

Respectfully submitted,
QUARLES & BRADY LLP

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Robert D.Atkins
Reg. No. 34,288

Address all correspondence to:
Robert D. Atkins
Quarles & Brady LLP
One Renaissance Square
Two North Central Avenue
Phoenix, AZ 85004
Telephone: (602) 229-5290
Facsimile: (602) 229-5690
Email: rda@quarles.com